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NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 17 May 2000 (17.05.00)	
International application No. PCT/IL99/00392	Applicant's or agent's file reference 34554
International filing date (day/month/year) 18 July 1999 (18.07.99)	Priority date (day/month/year) 20 July 1998 (20.07.98)
Applicant DARVISH, Nissim et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
21 January 2000 (21.01.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Nestor Santesso Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To: WALT THOMAS ZIELINSKI
DARBY & DARBY
805 THIRD AVENUE
NEW YORK, NEW YORK 10022

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NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

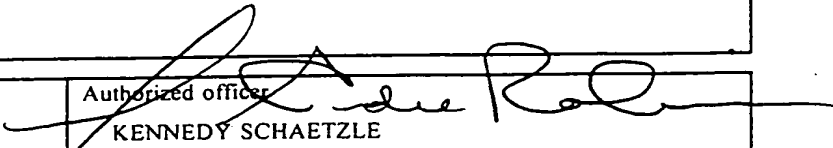
Date of Mailing (day/month/year)		20 SEP 2000	
Applicant's or agent's file reference 34554		IMPORTANT NOTIFICATION	
International application No. PCT/IL99/00392	International filing date (day/month/year) 18 JULY 1999	Priority Date (day/month/year) 20 JULY 1998	
Applicant IMPULSE DYNAMICS NV			

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer  KENNEDY SCHAETZLE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-2211

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

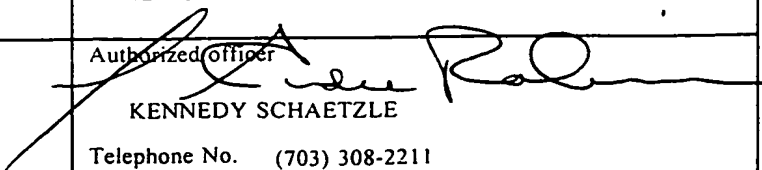
Applicant's or agent's file reference 34554	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IL99/00392	International filing date (day/month/year) 18 JULY 1999	Priority date (day/month/year) 20 JULY 1998
International Patent Classification (IPC) or national classification and IPC IPC(7): A61N 1/362; and US Cl.: 607/09		
Applicant IMPULSE DYNAMICS NV		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets.
- ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority. (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step or industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 21 JANUARY 2000	Date of completion of this report 12 AUGUST 2000
Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer  KENNEDY SCHAETZLE
Facsimile No. (703) 305-3230	Telephone No. (703) 308-2211

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/IL99/00392

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed☒ the description:

pages 1-24, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the claims:

pages 25-33, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the drawings:

pages 1-9, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

☒ the sequence listing part of the description:

pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/ or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☒ The amendments have resulted in the cancellation of:

- ☒ the description, pages NONE
☒ the claims, Nos. NONE
☒ the drawings, sheets/fig NONE

5. ☐ This report has been drawn as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

**Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/IL99/00392

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. statement**

Novelty (N)	Claims <u>1-99</u>	YES
	Claims <u>NONE</u>	NO
Inventive Step (IS)	Claims <u>1-99</u>	YES
	Claims <u>NONE</u>	NO
Industrial Applicability (IA)	Claims <u>1-99</u>	YES
	Claims <u>NONE</u>	NO

2. citations and explanations (Rule 70.7)

Claims 1-99 meet the criteria set out in PCT Article 33(2)-(4) because the prior art does not teach or fairly suggest the following:

Claims 1 and 49, use of signal generation circuitry which applies an extended pacing signal having an overall duration greater than three times a chronaxie time.

Claims 26 and 64, applies an extended train of bi-phasic pulses.

Claims 23 and 71, applies an extended pacing signal having an amplitude at least three times as great as a threshold for pacing the heart.

----- NEW CITATIONS -----

NONE

A.D

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WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

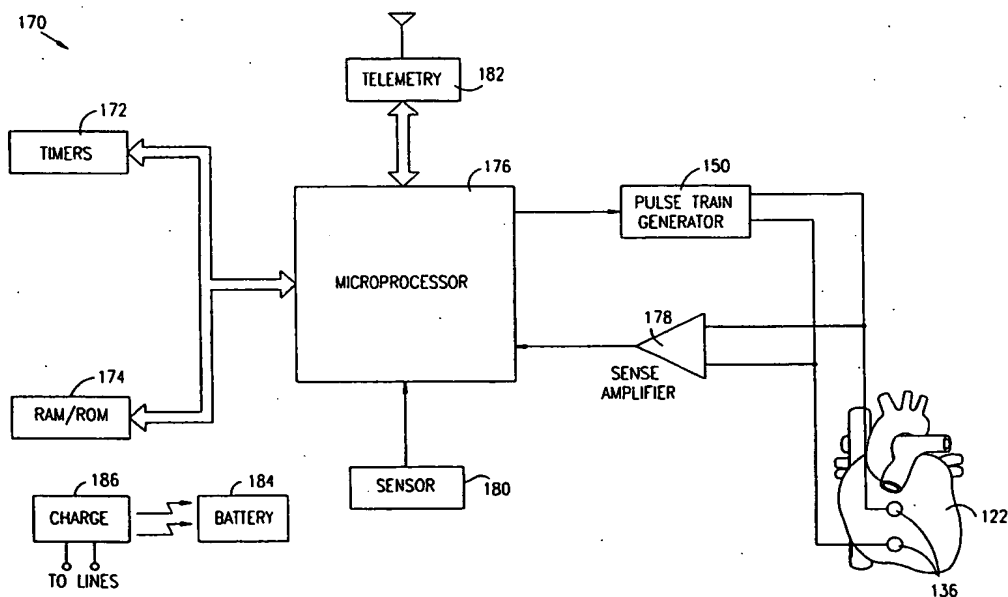
(51) International Patent Classification ⁷ : A61N		A2	(11) International Publication Number: WO 00/04947
			(43) International Publication Date: 3 February 2000 (03.02.00)
(21) International Application Number: PCT/IL99/00392 (22) International Filing Date: 18 July 1999 (18.07.99) (30) Priority Data: 125424 20 July 1998 (20.07.98) IL (71) Applicant (for all designated States except US): IMPULSE DYNAMICS N.V. [NL/NL]; 3 L.B. Smithplein, P.O. Box 6, Netherlands Antilles (AN). (72) Inventors; and (75) Inventors/Applicants (for US only): <u>DARVISH</u> , Nissim [IL/IL]; Hantke Street 22A, Haifa (IL). <u>FELSEN</u> , Bella [IL/IL]; Hatzvi Street 26, 34355 Haifa (IL). <u>SHEMER</u> , Itzik [IL/IL]; Hayarkon Street 11, 34465 Haifa (IL). <u>KORNFELD</u> , Judith [IL/IL]; Ilanot Street 31A, 34324 Haifa (IL). (74) Agents: COLB, Sanford, T. et al.; Sanford T. Colb & Co., P.O. Box 2273, 76122 Rehovot (IL).		(81) Designated States: AE, AL, AM, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ (Utility model), DE (Utility model), DK (Utility model), EE (Utility model), ES, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>	
(54) Title: PACING WITH HEMODYNAMIC ENHANCEMENT			
(57) Abstract			
<p>Apparatus (170) for heart pacing with hemodynamic improvement, including one or more electrodes (36), which convey electrical signals to respective cardiac muscle segments. Signal generation circuitry (50) applies an extended pacing signal (60, 61), having an overall duration greater than three times a chronaxie time, to the one or more electrodes so as to pace the heart. The signal preferably includes a train of a plurality of biphasic pulses, and has an amplitude at least three times as great as a threshold for pacing the heart, but not sufficient for cardioversion.</p>			



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : A61N 1/362		A3	(11) International Publication Number: WO 00/04947
			(43) International Publication Date: 3 February 2000 (03.02.00)
(21) International Application Number: PCT/IL99/00392		(81) Designated States: AE, AL, AM, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ (Utility model), DE (Utility model), DK (Utility model), EE (Utility model), ES, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).	
(22) International Filing Date: 18 July 1999 (18.07.99)			
(30) Priority Data: 125424 20 July 1998 (20.07.98) IL			
(71) Applicant (for all designated States except US): IMPULSE DYNAMICS N.V. [NL/NL]; 3 L.B. Smithplein, P.O. Box 6, Netherlands Antilles (AN).			
(72) Inventors; and (75) Inventors/Applicants (for US only): DARVISH, Nissim [IL/IL]; Hantke Street 22A, Haifa (IL). FELSEN, Bella [IL/IL]; Hatzvi Street 26, 34355 Haifa (IL). SHEMER, Itzik [IL/IL]; Hayarkon Street 11, 34465 Haifa (IL). KORNFELD, Judith [IL/IL]; Ilanot Street 31A, 34324 Haifa (IL).		Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	
(74) Agents: COLB, Sanford, T. et al.; Sanford T. Colb & Co., P.O. Box 2273, 76122 Rehovot (IL).		(88) Date of publication of the international search report: 15 June 2000 (15.06.00)	

(54) Title: PACING WITH HEMODYNAMIC ENHANCEMENT



(57) Abstract

Apparatus (170) for heart pacing with hemodynamic improvement, including one or more electrodes (36), which convey electrical signals to respective cardiac muscle segments. Signal generation circuitry (50) applies an extended pacing signal (60, 61), having an overall duration greater than three times a chronaxie time, to the one or more electrodes so as to pace the heart. The signal preferably includes a train of a plurality of biphasic pulses, and has an amplitude at least three times as great as a threshold for pacing the heart, but not sufficient for cardioversion.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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EE	Estonia	LR	Liberia	SG	Singapore		

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IL99/00392

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61N 1/362

US CL : 607/09

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 607/09, 11

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4,979,507 A (HEINZE et al.) 25 December 1990, entire document.	1-99

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X* document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y* document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*G* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

27 MARCH 2000

Date of mailing of the international search report

18 APR 2000

Name and mailing address of the ISA/US

Commissioner of Patents and Trademarks

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Authorized officer

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